

**[CLAIMS]**

5 [Claim 1] A rapid thermal processing system, comprising: a chamber provided at a lateral wall of the chamber with one or more processing gas injection ports and at the opposite lateral wall thereof with one or more processing gas exhaust ports; a heat source installed in the chamber for heating a wafer; a quartz window mounted on the chamber such that the quartz window can be located below the heat source; an edge ring-support installed in the chamber such that edge ring-support can be located below the quartz window; and an edge ring equipped on the edge ring-support for mounting the wafer,

10            wherein the chamber has an inner surface with a cross-section in a multi-line shape consisting of a plurality of arcs separated from each other and having the same radius and the same center and a plurality of straight lines connecting the arcs to each other.

15 [Claim 2] The rapid thermal processing system as set forth in claim 1, wherein each of the arcs has a central angle of  $15 \sim 50^\circ$ .

[Claim 3] The rapid thermal processing system as set forth in claim 1, wherein an O-ring is interposed between an outer peripheral surface of the quartz window and a mounting portion of the chamber at which the quartz window is mounted.

20 [Claim 4] The rapid thermal processing system as set forth in claim 3, wherein the outer peripheral surface of the quartz window consists of a combination of a tilt surface, a perpendicular surface, and a round surface.

25 [Claim 5] The rapid thermal processing system as set forth in claim 1, wherein the quartz window has an area larger than that of the inner surface of the chamber, and a square shape having edges, each opposing the straight line portion of the inner surface of the chamber while being positioned at the outside of the straight line portion; and  
          wherein the rapid thermal processing system further comprises one or more cooling water jackets, each being installed in the chamber such that the cooling water

jacket can be positioned at a lower portion of a region defined by the edge of the quartz window and the straight line portion of the inner surface of the chamber.

5 [Claim 6] The rapid thermal processing system as set forth in claim 1, wherein the chamber is formed at one lateral wall thereof with an injection pipe connected to a processing gas injection nozzle and having the processing gas injection ports aligned in the injection pipe, and each of the processing gas exhaust ports is formed with at least two exhaust ports aligned in the processing gas exhaust port and having a diameter larger than that of the processing gas injection port.

10 [Claim 7] The rapid thermal processing system as set forth in claim 1, wherein each of the processing gas exhaust ports is provided with an oxygen concentration detector.

[Claim 8] The rapid thermal processing system as set forth in claim 1, wherein the chamber is formed with a wafer feeding passage in the lateral wall of the chamber, and the processing gas injection nozzle connected to the processing gas injection ports are formed on a lateral wall of the wafer feeding passage.

15 [Claim 9] The rapid thermal processing system as set forth in claim 1, wherein the edge ring-support comprises: a rotational member installed in the chamber and having a rotational wing with a groove formed on an upper surface of the rotational wing; a cylinder connected to the rotational wing and mounting the edge ring on an upper surface of the cylinder; a cylinder guide engaged with the cylinder; and a cylinder  
20 guide-fixing pin for fixing the cylinder guide to the rotational wing.

[Claim 10] The rapid thermal processing system as set forth in claim 1, further comprising a cooling/heating water-circulation passage provided in an inner wall of the chamber such that the circulation passage surrounds an outer peripheral surface of the edge ring and a predetermined area of the edge ring-support.

25 [Claim 11] The rapid thermal processing system as set forth in claim 1, further comprising: a first cooling gas injection part for injecting a cooling gas into the

chamber; and a first cooling gas exhaust part for exhausting the cooling gas exhausted from the first cooling gas inject part to the outside of the chamber, the first cooling gas injection part and the first cooling gas exhaust part being installed on the bottom surface of the chamber.

- 5 [Claim 12] The rapid thermal processing system as set forth in claim 11, wherein the first cooling gas injection part comprises a plurality of injection holes radially arranged therein, and a cap installed at an upper portion of the injection holes to define a predetermined space opened between the injection holes and the cap.

- 10 [Claim 13] The rapid thermal processing system as set forth in claim 1, further comprising a second cooling gas injection part, formed on the lateral wall of the chamber while being spaced from the processing gas inject ports, for injecting the cooling gas over the wafer mounted on the edge ring, and having an injection end with a gentle slope formed at a predetermined region of the injection end, such that a portion of the cooling gas being injected can flow along the lateral wall of the chamber, and with a steep slope formed at a rest region of the injection end.

- 20 [Claim 14] The rapid thermal processing system as set forth in claim 10, wherein the cooling/heating water-circulation passage has a groove formed around an outer surface of the cooling/heating water-circulation passage facing the inner wall of the chamber, and the rapid thermal processing system may further comprise a third cooling gas injection part and a third cooling gas exhaust part installed in the chamber being connected to the groove, respectively.